

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- 5 (i) APPLICANT: Jardieu, Paula M.
 Presta, Leonard G.
- (ii) TITLE OF INVENTION: Humanized Anti-CD11a Antibodies
- 10 (iii) NUMBER OF SEQUENCES: 71
- (iv) CORRESPONDENCE ADDRESS:
 (A) ADDRESSEE: Genentech, Inc.
 (B) STREET: 1 DNA Way
15 (C) CITY: South San Francisco
 (D) STATE: California
 (E) COUNTRY: USA
 (F) ZIP: 94080
- 20 (v) COMPUTER READABLE FORM:
 (A) MEDIUM TYPE: 3.5 inch, 1.44 Mb floppy disk
 (B) COMPUTER: IBM PC compatible
 (C) OPERATING SYSTEM: PC-DOS/MS-DOS
25 (D) SOFTWARE: WinPatin (Genentech)
- (vi) CURRENT APPLICATION DATA:
 (A) APPLICATION NUMBER:
 (B) FILING DATE: 19-SEP-03
30 (C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
 (A) APPLICATION NUMBER: 60/031971
 (B) FILING DATE: 27-NOV-1996
- 35 (vii) PRIOR APPLICATION DATA:
 (A) APPLICATION NUMBER: 08/974899
 (B) FILING DATE: 20-NOV-1997
- 40 (vii) PRIOR APPLICATION DATA:
 (A) APPLICATION NUMBER: 09/420745
 (B) FILING DATE: 20-OCT-1999
- 45 (vii) PRIOR APPLICATION DATA:
 (A) APPLICATION NUMBER: 09/975798
 (B) FILING DATE: 28-FEB-2001
- (viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Tan, Lee K.
(B) REGISTRATION NUMBER: 39,447
(C) REFERENCE/DOCKET NUMBER: P1014R1C1D1C1

(ix) TELECOMMUNICATION INFORMATION:

5 (A) TELEPHONE: 650/225-4462
(B) TELEFAX: 650/952-9881

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

10 (A) LENGTH: 108 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

15 Asp Val Gln Ile Thr Gln Ser Pro Ser Tyr Leu Ala Ala Ser Pro
1 5 10 15
20 Gly Glu Thr Ile Ser Ile Asn Cys Arg Ala Ser Lys Thr Ile Ser
20 20 25 30
Lys Tyr Leu Ala Trp Tyr Gln Glu Lys Pro Gly Lys Thr Asn Lys
35 40 45
25 Leu Leu Ile Tyr Ser Gly Ser Thr Leu Gln Ser Gly Ile Pro Ser
50 55 60
Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile
65 70 75
30 Ser Ser Leu Glu Pro Glu Asp Phe Ala Met Tyr Tyr Cys Gln Gln
80 85 90
35 His Asn Glu Tyr Pro Leu Thr Phe Gly Thr Gly Thr Lys Leu Glu
95 100 105
Leu Lys Arg

40 (2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

45 (A) LENGTH: 108 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	Ala	Ser	Val	
	1					5				10					15	
	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Lys	Thr	Ile	Ser	
					20					25					30	
5	Lys	Tyr	Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	
					35					40					45	
	Leu	Leu	Ile	Tyr	Ser	Gly	Ser	Thr	Leu	Gln	Ser	Gly	Val	Pro	Ser	
10					50					55					60	
	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	
					65					70					75	
	Ser	Ser	Leu	Gln	Pro	Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	
15					80					85					90	
	His	Asn	Glu	Tyr	Pro	Leu	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	
					95					100					105	
20	Ile	Lys	Arg													

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 108 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	Ala	Ser	Val	
	1					5				10					15	
	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Gln	Ser	Ile	Ser	
					20					25					30	
	Asn	Tyr	Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	
40					35					40					45	
	Leu	Leu	Ile	Tyr	Ala	Ala	Ser	Ser	Leu	Glu	Ser	Gly	Val	Pro	Ser	
					50					55					60	
	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	
45					65					70					75	

Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln
80 85 90

Tyr Asn Ser Leu Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu
95 100 105

5

Ile Lys Arg

(2) INFORMATION FOR SEQ ID NO:4:

10

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 121 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Glu Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Met Arg Pro Gly
1 5 10 15

20

Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr
20 25 30

25

Gly His Trp Met Asn Trp Val Arg Gln Arg Pro Gly Gln Gly Leu
35 40 45

Glu Trp Ile Gly Met Ile His Pro Ser Asp Ser Glu Thr Arg Leu
50 55 60

30

Asn Gln Lys Phe Lys Asp Lys Ala Thr Leu Thr Val Asp Lys Ser
65 70 75

Ser Ser Ser Ala Tyr Met Gln Leu Ser Ser Pro Thr Ser Glu Asp
80 85 90

35

Ser Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr
95 100 105

40

Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser
110 115 120

Ser

(2) INFORMATION FOR SEQ ID NO:5:

45

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 121 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

5
 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly
 1 5 10 15
 Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Tyr Ser Phe Thr
 10 20 25 30
 Gly His Trp Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
 35 40 45
 15 Glu Trp Val Gly Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr
 50 55 60
 Asn Gln Lys Phe Lys Asp Arg Phe Thr Ile Ser Val Asp Lys Ser
 65 70 75
 20 Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
 80 85 90
 Thr Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr
 25 95 100 105
 Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser
 110 115 120
 30 Ser

(2) INFORMATION FOR SEQ ID NO:6:

35 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 113 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly
 1 5 10 15
 45 Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser
 20 25 30

Ser Tyr Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
 35 40 45
 Glu Trp Val Ser Val Ile Ser Gly Asp Gly Gly Ser Thr Tyr Tyr
 50 55 60
 5 Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
 65 70 75
 10 Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
 80 85 90
 Thr Ala Val Tyr Tyr Cys Ala Arg Gly Phe Asp Tyr Trp Gly Gln
 95 100 105
 15 Gly Thr Leu Val Thr Val Ser Ser
 110

(2) INFORMATION FOR SEQ ID NO:7:

20 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 184 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Lys Gly Asn Val Asp Leu Val Phe Leu Phe Asp Gly Ser Met Ser
 1 5 10 15
 30 Leu Gln Pro Asp Glu Phe Gln Lys Ile Leu Asp Phe Met Lys Asp
 20 25 30
 Val Met Lys Lys Leu Ser Asn Thr Ser Tyr Gln Phe Ala Ala Val
 35 40 45
 35 Gln Phe Ser Thr Ser Tyr Lys Thr Glu Phe Asp Phe Ser Asp Tyr
 50 55 60
 Val Lys Arg Lys Asp Pro Asp Ala Leu Leu Lys His Val Lys His
 65 70 75
 40 Met Leu Leu Leu Thr Asn Thr Phe Gly Ala Ile Asn Tyr Val Ala
 80 85 90
 45 Thr Glu Val Phe Arg Glu Glu Leu Gly Ala Arg Pro Asp Ala Thr
 95 100 105

Lys Val Leu Ile Ile Ile Thr Asp Gly Glu Ala Thr Asp Ser Gly
 110 115 120
 Asn Ile Asp Ala Ala Lys Asp Ile Ile Arg Tyr Ile Ile Gly Ile
 125 130 135
 5 Gly Lys His Phe Gln Thr Lys Glu Ser Gln Glu Thr Leu His Lys
 140 145 150
 10 Phe Ala Ser Lys Pro Ala Ser Glu Phe Val Lys Ile Leu Asp Thr
 155 160 165
 Phe Glu Lys Leu Lys Asp Leu Phe Thr Glu Leu Gln Lys Lys Ile
 170 175 180
 15 Tyr Val Ile Glu

(2) INFORMATION FOR SEQ ID NO:8:

20 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 184 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Lys Gly Asn Val Asp Leu Ile Phe Leu Phe Asp Gly Ser Met Ser
 1 5 10 15
 30 Leu Gln Pro Asp Glu Phe Gln Lys Ile Leu Asp Phe Met Lys Asp
 20 25 30
 Val Met Lys Lys Leu Ser Asn Thr Ser Tyr Gln Phe Ala Ala Val
 35 35 40 45
 Gln Phe Ser Thr Ser Tyr Lys Thr Glu Phe Asp Phe Ser Asp Tyr
 50 55 60
 40 Val Lys Gln Lys Asp Pro Asp Ala Leu Leu Glu His Val Lys His
 65 70 75
 Met Leu Leu Leu Thr Asn Thr Phe Gly Ala Ile Asn Tyr Val Ala
 80 85 90
 45 Thr Glu Val Phe Arg Glu Glu Leu Gly Ala Arg Pro Asp Ala Thr
 95 100 105

5 Lys Val Leu Ile Ile Ile Thr Asp Gly Glu Ala Thr Asp Ser Gly
 110 115 120
 Asn Ile Asp Ala Ala Lys Asp Ile Ile Arg Tyr Ile Ile Gly Ile
 125 130 135
 Gly Lys His Phe Gln Thr Lys Glu Ser Gln Glu Thr Leu His Lys
 140 145 150
 10 Phe Ala Ser Lys Pro Ala Ser Glu Phe Val Lys Ile Leu Asp Thr
 155 160 165
 Phe Glu Lys Leu Lys Asp Leu Phe Thr Glu Leu Gln Lys Lys Ile
 170 175 180
 15 Tyr Ala Ile Glu

(2) INFORMATION FOR SEQ ID NO:9:

20 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 7 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Lys His Val Lys His Met Leu
 1 5

30 (2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10 amino acids
 (B) TYPE: Amino Acid
 35 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

40 Gly Tyr Ser Phe Thr Gly His Trp Met Asn
 1 5 10

(2) INFORMATION FOR SEQ ID NO:11:

45 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 17 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

5 Lys Asp

(2) INFORMATION FOR SEQ ID NO:12:

10 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 12 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Gly Ile Tyr Phe Tyr Gly Thr Thr Tyr Phe Asp Tyr
1 5 10

20 (2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: Amino Acid
25 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

30 Arg Ala Ser Lys Thr Ile Ser Lys Tyr Leu Ala
1 5 10

(2) INFORMATION FOR SEQ ID NO:14:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

40 Ser Gly Ser Thr Leu Gln Ser
1 5

(2) INFORMATION FOR SEQ ID NO:15:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids

(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

5 Gln Gln His Asn Glu Tyr Pro Leu Thr
1 5

(2) INFORMATION FOR SEQ ID NO:16:

10 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Pro Lys Asn Ser Ser Met Ile Ser Asn Thr Pro
1 5 10

20 (2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid
25 (D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

30 His Gln Ser Leu Gly Thr Gln
1 5

(2) INFORMATION FOR SEQ ID NO:18:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

40 His Gln Asn Leu Ser Asp Gly Lys
1 5

(2) INFORMATION FOR SEQ ID NO:19:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids

(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

5 His Gln Asn Ile Ser Asp Gly Lys
1 5

(2) INFORMATION FOR SEQ ID NO:20:

10 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY: Linear

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Val Ile Ser Ser His Leu Gly Gln
1 5

20 (2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: Nucleic Acid
25 (C) STRANDEDNESS: Single
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

30 CACTTTGGAT ACCGCGTCCT GCAGGT 26

(2) INFORMATION FOR SEQ ID NO:22:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 base pairs
(B) TYPE: Nucleic Acid
(C) STRANDEDNESS: Single
(D) TOPOLOGY: Linear

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

45 CATCCTGCAG GTCTGCCTTC AGGTCA 26

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 17 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Met Ile Ala Pro Ala Ser Ser Ser Thr Arg Tyr Asn Gln Lys Phe
 1 5 10 15

10 Lys Asp

(2) INFORMATION FOR SEQ ID NO:24:

15 (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 121 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY: Linear

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly
 1 5 10 15

25 Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Tyr Ser Phe Thr
 20 25 30

Gly His Trp Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
 35 40 45

30 Glu Trp Val Gly Met Ile Ala Pro Ala Ser Ser Ser Thr Arg Tyr
 50 55 60

35 Asn Gln Lys Phe Lys Asp Arg Phe Thr Ile Ser Val Asp Lys Ser
 65 70 75

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
 80 85 90

40 Thr Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr
 95 100 105

Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser
 110 115 120

45 Ser

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Gly Tyr Ser Phe Thr Gly His Trp Met Asn
1 5 10

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Gly Tyr Ala Phe Ala Gly Ala Trp Met Asn
1 5 10

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Gly Tyr Ala Phe Thr Gly His Trp Met Asn
1 5 10

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Gly Tyr Ser Phe Ala Gly His Trp Met Asn
1 5 10

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Gly Tyr Ser Phe Thr Ala His Trp Met Asn
 1 5 10

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Gly Tyr Ser Phe Thr Gly Ala Trp Met Asn
 1 5 10

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Gly Tyr Ser Phe Thr Gly His Ala Met Asn
 1 5 10

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 17 amino acids
 (B) TYPE: Amino Acid
 (D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
 1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:33:

- 5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

- 10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

Met Ile Ala Pro Ala Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

15 Lys Asp

(2) INFORMATION FOR SEQ ID NO:34:

- 20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

- 25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Met Ile His Pro Ser Ala Ser Ala Thr Ala Tyr Asn Gln Lys Phe
1 5 10 15

30 Lys Asp

(2) INFORMATION FOR SEQ ID NO:35:

- 35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

- 40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Met Ile Ala Pro Ala Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

45 Lys Asp

(2) INFORMATION FOR SEQ ID NO:36:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

Met Ile His Pro Ala Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15
Lys Asp

(2) INFORMATION FOR SEQ ID NO:37:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

Met Ile Ala Pro Ser Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15
Lys Asp

(2) INFORMATION FOR SEQ ID NO:38:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Met Ile Ala Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15
Lys Asp

(2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Met Ile Ser Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Met Ile His Pro Ala Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Met Ile His Pro Ser Ala Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

Lys Asp

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Met Ile His Pro Ser Asp Ala Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

5 Lys Asp

(2) INFORMATION FOR SEQ ID NO:43:

10 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Met Ile His Pro Ser Asp Asn Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

20 Lys Asp

(2) INFORMATION FOR SEQ ID NO:44:

25 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Met Ile His Pro Ser Asp Gln Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

35 Lys Asp

(2) INFORMATION FOR SEQ ID NO:45:

40 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

45 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Met Ile His Pro Ser Asp Ser Ala Thr Arg Tyr Asn Gln Lys Phe

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

Ala Asp

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

Met Ile His Pro Ser Asp Ser Glu Thr Arg Tyr Asn Gln Lys Phe
1 5 10 15

Lys Ala

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Gly Ile Tyr Phe Tyr Gly Thr Thr Tyr Phe Asp
1 5 10

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 11 amino acids

(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

5 Gly Ile Tyr Phe Tyr Gly Ala Thr Tyr Phe Asp
1 5 10

(2) INFORMATION FOR SEQ ID NO:57:

10 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

15 Gly Ile Tyr Phe Tyr Gly Thr Ala Tyr Phe Asp
1 5 10

(2) INFORMATION FOR SEQ ID NO:58:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

30 Gly Ile Tyr Phe Tyr Gly Thr Thr Ala Phe Asp
1 5 10

(2) INFORMATION FOR SEQ ID NO:59:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

40 Arg Ala Ser Lys Thr Ile Ser Lys Tyr Leu Ala
1 5 10

(2) INFORMATION FOR SEQ ID NO:60:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 11 amino acids
(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

5 Arg Ala Ser Ala Ala Ile Ala Ala Tyr Leu Ala
1 5 10

(2) INFORMATION FOR SEQ ID NO:61:

10 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

15 Ser Gly Ser Thr Leu Gln Ser
1 5

(2) INFORMATION FOR SEQ ID NO:62:

20 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

25 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

Ala Gly Ala Ala Leu Gln Ser
1 5

30 (2) INFORMATION FOR SEQ ID NO:63:

35 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

40 Ala Gly Ser Thr Leu Gln Ser
1 5

(2) INFORMATION FOR SEQ ID NO:64:

45 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

Ser Gly Ala Thr Leu Gln Ser
1 5

(2) INFORMATION FOR SEQ ID NO:65:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

Ser Gly Ser Ala Leu Gln Ser
1 5

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

Gln Gln His Asn Glu Tyr Pro Leu Thr
1 5

(2) INFORMATION FOR SEQ ID NO:67:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

Gln Gln His Ala Ala Ala Pro Leu Thr
1 5

(2) INFORMATION FOR SEQ ID NO:68:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: Amino Acid

(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

Gln Gln Ala Asn Glu Tyr Pro Leu Thr
1 5

(2) INFORMATION FOR SEQ ID NO:69:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

Gln Gln His Ala Glu Tyr Pro Leu Thr
1 5

(2) INFORMATION FOR SEQ ID NO:70:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

Gln Gln His Asn Ala Tyr Pro Leu Thr
1 5

(2) INFORMATION FOR SEQ ID NO:71:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: Amino Acid
(D) TOPOLOGY:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

Gln Gln His Asn Glu Ala Pro Leu Thr
1 5